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EXAMINER	
DAVIS, CYNTHIA L	
ART UNIT	**PAPER NUMBER**
2665	

DATE MAILED: 10/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/892,492	GRAVES ET AL.
	Examiner	Art Unit
	Cynthia L. Davis	2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 9/13/2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 9/13/2005, with respect to the rejection(s)of claim(s) 1-36 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the Munks reference.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 18-20, 26, 28-29, 31, and 33-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Munks.

Regarding claim 1, A multi-channel optical filter for filtering the generated carrier signal, each said filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a different respective channel center frequency is disclosed in Munks, column 4, lines 1-10 (the filters have different filtering functions). A detection unit for determining an indication of a characteristic of the target carrier frequency in said first and second filtered optical signals is disclosed in Munks, column 4, lines 10-13. A control unit for adjusting the optical carrier frequency of the generated carrier signal as a function of the difference in the indication of said

characteristic of the target carrier frequency in the first and second filtered optical signals is disclosed in Munks, column 4, lines 13-17 (the error circuit).

Regarding claim 3, an optical source adapted to generate an optical signal including at least one carrier signal at a respective generated carrier frequency that is adjustable by a corresponding frequency control signal, each carrier signal being associated with a respective target carrier frequency is disclosed in Munks, figure 1, element 12 (the laser generator). A multi-channel optical filter having a filter input port connected to the optical source and having a plurality of filter output ports, each filter output port being associated with a respective optical channel having a pass band surrounding a different respective channel center frequency is disclosed in is disclosed in Munks, column 4, lines 1-10 (the filters have different filtering functions). For at least one target carrier frequency, a first and second detection unit each associated with said target carrier frequency and connected to different ones of the filter output ports, each detection unit associated with a particular target carrier frequency being adapted to output an indication of a characteristic of the particular target carrier frequency in the optical signal present at the filter output port to which said detection unit is connected is disclosed in Munks, column 4, lines 10-13. A control unit connected to the detection units and to the optical source, the control unit being operable to generate the frequency control signal corresponding to a particular carrier signal as a function of the output of the detection units associated with the target carrier frequency associated with the particular carrier signal, thereby to align the generated carrier frequency of the particular

carrier signal with the target carrier frequency associated with the particular carrier signal is disclosed in Munks, column 4, lines 13-17 (the error circuit).

Regarding claim 29, optically filtering the generated carrier signal to provide a first filtered optical signal and a second filtered optical signal, each said filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a different respective channel center frequency is disclosed in is disclosed in Munks, column 4, lines 1-10 (the filters have different filtering functions). Determining an indication of a characteristic of the target carrier frequency in said first and second filtered optical signals is disclosed in Munks, column 4, lines 10-13. Adjusting the optical carrier frequency of the generated carrier signal as a function of the difference in the indication of said characteristic of the target carrier frequency in the first and second filtered optical signals is disclosed in Munks, column 4, lines 13-17 (the error circuit).

Regarding claim 33, means for optically filtering the generated carrier signal to provide a first filtered optical signal and a second filtered optical signal, each said filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a different respective channel center frequency is disclosed in Munks, column 4, lines 1-10 (the filters have different filtering functions). Means for determining an indication of a characteristic of the target carrier frequency in said first and second filtered optical signals is disclosed in Munks, column 4, lines 10-13. Means for adjusting the optical carrier frequency of the generated carrier signal as a function of the difference in the indication of said characteristic of the target carrier frequency in the

first and second filtered optical signals is disclosed in Munks, column 4, lines 13-17 (the error circuit).

Regarding claim 35, a detection module adapted to receive a first filtered optical signal and a second filtered optical signal, each said filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a different respective channel center frequency, said detection module further adapted to determine an indication of a characteristic of the target carrier frequency in said first and second filtered optical signals is disclosed in Munks, column 4, lines 3-13. A control module for adjusting the optical carrier frequency of the generated carrier signal as a function of the difference in the indication of a characteristic of the target carrier frequency in the first and second filtered optical signals is disclosed in Munks, column 4, lines 13-17 (the error circuit).

Regarding claim 36, receiving a first and second optically filtered versions of the generated carrier signal, each version including a portion of the generated carrier signal contained in a pass band surrounding a different respective channel center frequency is disclosed is disclosed in Munks, column 4, lines 3-13. Determining an indication of a characteristic of the target carrier frequency in said first and second versions of the generated carrier signal is disclosed in Munks, column 4, lines 10-13. Determining an adjustment value for adjusting the optical carrier frequency of the generated carrier signal as a function of the difference in the indication of said characteristic of the target carrier frequency in the first and second filtered versions of the generated carrier signal is disclosed in Munks, column 4, lines 13-17 (the error circuit). A computer readable

storage medium containing a program element for execution by a computing device to implement a method of stabilizing an optical carrier frequency of a generated carrier signal with respect to a target carrier frequency is missing from Munks. However, Miyazaki discloses in column 2, lines 38-43, using a computer to control an optical stabilization system. It would have been obvious to one skilled in the art at the time of the invention to use a computer readable storage medium to implement the method of Munks. The motivation would be to have a convenient medium for implementing the method.

Regarding claim 2, a plurality of apparatuses as claimed in claim 1 is disclosed in Munks, column 4, line 56-column 5, line 18 (disclosing a system with more filters and error control units, which would comprise a plurality of apparatuses. A switch for controlling whether the respective generated carrier signal exits said apparatus is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55. The control units being interconnected and each being further adapted to control the respective switch in order to ensure that the generated carrier signal is allowed to exit at most one of said apparatuses is disclosed in Munks, column 5, lines 9-18. A combiner for combining the carrier signals exiting the plurality of apparatuses is disclosed in Munks, column 8, lines 15-16.

Regarding claim 18, a power combiner associated with each of a least one target carrier frequency, wherein the power combiner associated with a particular target carrier frequency comprises the inputs respectively connected to the first and second detection

units associated with the particular target carrier frequency is disclosed in Munks, column 14, lines 38-45

Regarding claim 19, the power combiner associated with a particular target carrier frequency being adapted to determine the total power of the modulation signal associated with the particular target carrier frequency as measured in different optical channels, and the control unit being further adapted to adjust the amplitude of the carrier signal associated with the particular target carrier frequency as a function of the output of the power combiner associated with the particular carrier frequency is disclosed in Munks, column 14, lines 38-45 (amplitude is related to power, the power of the laser is leveled).

Regarding claim 20, each of the first and second detection units associated with a particular target carrier frequency comprising a power monitor adapted to measure a power level of the optical signal present at the filter output port to which said detection unit is connected, each of the first and second detection units associated with a particular target carrier frequency being further adapted to provide the respective measured power level to a respective input of the power combiner to which said detection unit is connected is disclosed in Munks, column 14, lines 38-45 (the power of both signals is detected in order to know the ratio of the signals).

Regarding claim 26, the optical signal generated by the source including at least two carrier signals wherein the optical source comprises an optical multiplexer for combining the at least one carrier signal into a composite optical signal, said optical

multiplexer having an output port connected to the filter input port is disclosed in Munks, column 16, lines 10-14.

Regarding claim 28, each optical signal generator further comprising a switch for controllably allowing selected carrier signals to exit said optical signal generator is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55. The control units of said optical signal generators being interconnected and each being further adapted to control the respective switch in order to ensure that the carrier signal associated with each target carrier frequency is allowed to exit at most one of the said optical signal generators is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55 (the switch is part of the control unit). A combiner for combing the carrier signals exiting the plurality of optical signal generators is disclosed in Munks, column 8, lines 15-16.

Regarding claim 31, modulating the carrier signal in accordance with a modulation signal having a characteristic uniquely associated with the target carrier frequency signal is disclosed in Munks, column 13, lines 54-56. Determining an indication of a characteristic of the target carrier frequency in said first and second filtered optical signals comprises determining an indication of the extent to which said characteristic of the modulation signal appears in said first and second optical signals is disclosed in Munks, column 15, line 67-column 16, line 7.

Regarding claim 34, means for combining said generated carrier signal with at least one other generated carrier signal at a different optical carrier frequency is disclosed in Munks, column 8, lines 15-16.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 4-6, 8-10, 13, 21-25, 30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Fuse.

Regarding claim 4, the first detection unit associated with a particular target carrier frequency being connected to a filter output port associated with an optical channel having a channel center frequency less than the particular target carrier frequency and wherein the second detection unit associated with the particular target carrier frequency is connected to a filter output port associated with an optical channel having a channel center frequency greater than the particular target carrier frequency is missing from Munks. However, Fuse discloses in column 4, lines 40-50, a plurality of filter outputs, some above and some below the center target frequency. It would have been obvious to separate the signal based on frequency in the system of Munks. The motivation would be to be able to achieve a larger, higher speed optical communications apparatus (Fuse, column 4, lines 31-33).

Regarding claim 5, the optical source being adapted to modulate at least one carrier signal in accordance with a modulation signal having a characteristic uniquely associated with the target carrier frequency associated with the carrier signal is disclosed in Munks, column 13, lines 54-56. Each detection unit associated with a particular target carrier frequency is adapted to output an indication of the extent to which said characteristic of the modulation signal associated with the particular target

carrier frequency appears in the optical signal present at the filter output port to which said detection unit is connected is disclosed in Munks, column 15, line 67-column 16, line 7.

Regarding claim 6, the optical source being adapted to modulate at least one carrier signal in accordance with a modulation signal uniquely associated with the target carrier frequency associated with the carrier signal is disclosed in Munks, column 13, lines 54-56. Each detection unit associated with a particular target carrier frequency is adapted to output the amplitude of the modulation signal associated with the particular target carrier frequency appearing in the optical signal present at the filter output port to which said detection unit is connected is disclosed in Munks, column 15, line 67-column 16, line 7.

Regarding claim 8, the control unit comprising a comparator connected to the first and second detection units associated with the same target carrier frequency is disclosed in Munks, column 4, lines 13-17 (the error circuit calculates deviation of the two signals, which involves making a comparison).

Regarding claim 9, the comparator being adapted to determine the difference in the amplitude of the modulation signal associated with said same target carrier frequency as measured in different optical channels is disclosed in Munks, column 4, lines 13-17 (amplitude is related to wavelength). The control unit being further adapted to compare said difference to a pre-determined offset, thereby to generate the frequency control signal corresponding to the carrier signal associated with said same

target carrier frequency is disclosed in Munks, column 4, lines 13-17 (the set point is the predetermined offset).

Regarding claim 10, the predetermined offset depending on the response of the optical filter in the pass bands of the optical channels associated with the two different filter output ports to which said first and second detection units are connected is disclosed in Munks, column 5, lines 10-14.

Regarding claim 13, the channel center frequencies being aligned with the target carrier frequencies is disclosed in Munks, column 8, lines 15-16 (when combining the signals they would be aligned).

Regarding claim 21, the optical source being adapted to modulate at least one carrier signal in accordance with a modulation signal having a characteristic uniquely associated with the target carrier frequency associated with the carrier signal is disclosed in Munks, column 13, lines 54-56. The detection units including a modulation signal detector adapted to output an indication of the extent of to which said characteristic of the modulation signal associated with the particular target frequency appears in the optical signal present at the filter output pod to which said detection unit is connected is disclosed in Munks, column 15, line 67-column 16, line 7. A power monitor adapted to measure a power level of the optical signal present at the filter output port to which said detection unit is connected is disclosed in Munks, column 14, lines 38-45. The control unit including a comparator associated with the particular target carrier frequency is disclosed in Munks, column 4, lines 13-17 (the error circuit calculates deviation of the two signals, which involves making a comparison). A switch

having inputs connected to the modulation signal detector and the power monitor in both the first and second signal detection units associated with the particular target carrier frequency and having outputs connected to the comparator associated with the particular target carrier frequency, the switch being operable in a first state wherein the output of the modulation signal detectors is provided to the comparator and a second state wherein the output of the power monitors is provided to the comparator is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55.

Regarding claim 22, the comparator associated with a particular target carrier frequency being adapted to determine the difference between the signals received from the switch to which it is connected is disclosed in Munks, column 4, lines 13-17 (the error circuit calculates deviation of the two signals, which involves making a comparison). The control unit being further adapted to compare said difference to a predetermined signal offset, thereby to generate the frequency control signal corresponding to the carrier signal associated with the particular target carrier frequency is disclosed in Munks, column 4, lines 13-17 (they are compared to a set point wavelength).

Regarding claim 23, each switch being operable to change states as a function of the stability of the difference determined by the comparator to which said switch is connected is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55.

Regarding claim 24, a power combiner associated with each of at least one target carrier frequency, wherein the power combiner associated with a particular target carrier frequency comprises two inputs connected to the outputs of the switch

connected to the first and second detection units associated with the particular target carrier frequency is disclosed in Munks, column 14, lines 38-45

Regarding claim 25, the power combiner associated with a particular target carrier frequency being adapted to determine an estimate of the total power of the modulation signal associated with the particular target carrier frequency as measured in different optical channels is disclosed in Munks, column 14, lines 38-45. The control unit being further adapted to adjust the amplitude of the carrier signal associated with the particular target carrier frequency as a function of the output of the power combiner associated with the target carrier frequency associated with the particular carrier signal is disclosed in Munks, column 14, lines 38-45 (amplitude is related to power, the whole system is leveled using the output).

Regarding claim 30, the first filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a channel center frequency that is less than the optical carrier frequency of the generated carrier signal, said second filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a channel center frequency that is greater than the optical carrier frequency of the generated carrier signal is missing from Munks. However, Fuse discloses in column 4, lines 40-50, a plurality of filter outputs, some above and some below the center target frequency. It would have been obvious to separate the signal based on frequency in the system of Munks. The motivation would be to be able to achieve a larger, higher speed optical communications apparatus (Fuse, column 4, lines 31-33).

Regarding claim 32, the first filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a channel center frequency that is less than the optical carrier frequency of the generated carrier signal, said second filtered optical signal including the portion of the generated carrier signal contained in a pass band surrounding a channel center frequency that is greater than the optical carrier frequency of the generated carrier signal is missing from Hall. However, Munks does disclose in column 4, lines 7-10, that the two beams have different respective frequencies. Also, Fuse discloses in column 4, lines 40-50, a plurality of filter outputs, some above and some below the center target frequency. It would have been obvious to separate the signal based on frequency. The motivation would be to be able to achieve a larger, higher speed optical communications apparatus (Fuse, column 4, lines 31-33).

4. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Fuse in further view of Khoe.

Regarding claim 7, each modulation signal associated with a different target carrier frequency has a set of at least one unique electrical frequency is missing from Munks. This is disclosed in Khoe, column 4, lines 62-64. It would have been obvious to one skilled in the art at the time of the invention to have separate the electrical frequencies for the carriers. The motivation would be to be able to use an efficient mode of operation (Khoe, column 4, lines 47-48).

Regarding claim 17, a third detection unit associated with a third carrier frequency and connected to the particular filter output pod whose associated channel

center frequency is closest to said target carrier frequency, wherein the third detection unit associated with a particular target carrier frequency is adapted to output the amplitude of the modulation signal associated with the particular carrier frequency as it appears in the optical signal present at the filter output port to which said third detection unit is connected is disclosed in Munks, column 5, lines 8-10.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Fuse in further view of Hall.

Regarding claim 11, the offset being substantially zero is missing from Munks. However, Hall discloses in column 5, line 68-column 6, line 2, and column 8, lines 31-33, that when the beams are the same, the offset is zero). It would have been obvious to one skilled in the art at the time of the invention to have the offset be substantially zero. The motivation would be to transmit at the correct source frequency (Hall, column 8, line 31).

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Fuse in further view of Kaminow.

Regarding claim 12, the channel center frequencies and the target carrier frequency being interleaved is missing from Munks. This is disclosed in Kaminow, column 2, lines 46-48. It would have been obvious to one skilled in the art at the time of the invention to interleave the signals. The motivation would be to to combine the signals on a greater capacity transmission path (Kaminow, column 2, lines 44-46).

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Fuse in further view of Iida.

Regarding claim 14, the at least two channel center frequencies being located between each pair of adjacent target carrier frequencies is missing from Munks. However, Iida discloses in column 2, lines 52-53 a plurality of signals and subcarriers, which may have two center frequencies between carrier frequencies. It is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a recited value. Burden of showing criticality is on applicant. In re Mason, 87 F.2d 370, 32 USPQ 232 (CCPA 1937).

8. Claims 15, 16, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munks in view of Iida.

Regarding claim 15, a coarse wavelength capture module connected between at least one filter output port and the optical source, said coarse wavelength capture module being adapted to determine whether at least one generated carrier frequency is substantially outside a neighborhood of the associated target carrier frequency and further adapted to instruct the optical source to adjust such generated carrier frequency until it is determined to be within said neighborhood of the associated target frequency is missing from Munks. However, Iida discloses in column 2, lines 59-61 a the frequency signal source outputs a signal within the neighborhood of a desired frequency. It would have been obvious to one skilled in the art at the time of the invention to include means for assuring that the outputted wavelength is in the desired neighborhood. The motivation would be to have the outputted frequency be closely related to the target.

Regarding claim 16, an output switch connected to the optical source, for controllably passing selected ones of the carrier signals generated by the source to a location external to the optical signal generator, said output switch being controllable by said course wavelength capture module to block at least one carrier signal when its associated generated carrier frequency is outside said neighborhood of the associated target carrier frequency is disclosed in Munks, figure 5C element 154 and column 11, lines 52-55.

Regarding claim 27, at least one receiver connected between a respective one of the filter output ports and at least one of the detection units, each receiver being adapted to provide opto-electronic conversion of an optical signal received from the respective filter output port into an electrical signal provided to the at least one of the detection units is missing from Munks. This is disclosed in Iida, column 4, lines 22-24 (the O/E converter is located in the receiver). It would have been obvious to one skilled in the art at the time of the invention to convert the signal to an electrical signal. The motivation would be to have a low-cost electrical receiver for the signal (Iida, column 2, lines 46-48).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L. Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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